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ABSTRACT

A study examined the effect of a computer network which was designed to create a functional learning environment to engage students in writing as a communicative act with a real audience. Subjects, 44 seventh-grade Israeli students, wrote an essay as part of their regular midterm examination and, a week later, wrote another essay for their peers, intended for transmission through an international newswire service to a network of computers located in Virginia. Students wrote their essays in Hebrew without the use of computers. The essays for the network were then translated into Spanish or English for the computer-linked audience. Results indicated that student essays written for a real audience (their peers) were better organized and dealt with the content in a more informative and elaborate fashion than did the essays written for the exam. (Two tables of data are included; 57 references are attached.) (RS)

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Report 15

Computer Networks: Creating Real Audiences for Students' Writing

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Abstract

Audience awareness and analysis plays an important role in the process of writing by experienced writers but is often non-existent in the writing of school age children. The decontextualized approach to writing prevalent in classrooms is proposed as an alternative explanation, instead of the developmental interpretations, for childrens' reported inability to adapt their writing for different audiences. A computer network was utilized to create a functional learning environment to engage students in writing as a communicative act with a real audience. Two 7th grade classrooms with 22 students each wrote alternately for a computer network and for a semester grade, controlled for order effects. In both groups there was a significant difference between the essays written for evaluation and communication. The findings indicate that the development of functional writing environments which contextualize students' learning activities in the classroom, can improve the quality of students' writing.

AUDIENCE EFFECT ON WRITING

Writing is a communicative act, a way of sharing observations, information, thoughts or ideas with ourselves and others. Writing is usually directed to a person or persons for a specific purpose. An exception to this is the writing that children routinely do in classrooms. Students usually learn to write in schools by first writing words, then isolated sentences and only later paragraphs -- all outside of the context of communication. They are often asked to write about things and events (like the perennial

"How I spent my summer vacation" assignment) with no specified purpose (other than to practice writing) and addressed to no one in particular (other than the teacher as evaluator).

With the isolation of children from the workplace by the creation of schools, all learning-- not just writing-- has become decontextualized. Skills are no longer learned in the context of their use; instead, they are decomposed into subtasks which are taught in sequence with relatively more emphasis on learning the subtasks and less emphasis on the relationship of the tasks to the skill and the eventual integration of the subtasks into skilled behavior. Students spend years on grammar exercises, for example, before they have developed an understanding of the need for common conventions in writing. The rationale for dividing the skill into small subtasks is the learner's lack of skill to accomplish the task coupled with the notion that the learner needs to work alone to achieve individual competence.

The decontextualized approach to learning has been challenged by those who study the way that children learn and the social collaborative aspect of learning (Dewey 1955, 1963; Piaget 1932; Bruner 1966, 1973, Vygotsky 1962; Wertsch 1985; Heap 1985; Cole et al, 1978; Riel 1985). Another challenge to decontextualized learning has come from studies of the transfer of learning, indicating that successful classroom learning is not always predictive of productive skill in the workplace (Scribner 1977; Lave 1979; Stitch 1982). Learning is transferred when the context of use and the context of instruction become more similar. Recent efforts to re-contextualize learning in this way have been described as the creation of "functional learning

environments" (LCHC 1982; Newman 1984; Riel 1985; Mehan, et. al. 1986).

Functional learning environments are focused contexts in which novices learn skills by participating in similar activities as experts while receiving the necessary support to make their participation successful. Creating a functional learning environment for writing requires understanding the context of writing of (1) the expert writer, (2) the novice writer and (3) the social constraints of the classroom.

The Expert Writer and the Context of Writing

Researchers interested in writing have studied the skill as displayed by expert writers. Beginning with Aristotle's Rhetoric, they investigate how expert speakers and writers characterize their skill. Often employing verbal protocols, they examine how skilled writers talk about what they are doing while planning and composing text. Different aspects of the writing task are varied to help isolate the important features of the skill (Flower and Hayes 1980; Barkenkotter 1981; Monahan 1984). This research repeatedly reports on the importance of the writer's analysis of his or her audience in relationship to the writing process and the rhetorical situation. "Audience analysis" is described as the methods used by speakers and writers to draw inferences about the experiences, beliefs and attitudes of an audience to help make decisions about the organization and content of their work (Ede 1984).

This research has also shown that more competent writers are more likely than basic writers to analyse their audience and to use this information to make important decisions in the composition of text. Verbal

protocols indicate that experienced writers develop a strong mental image of their audience during all phases of writing while less skilled writers tend to be "topic-bound," paying little attention to audience (Flower 1979, Flowers and Hayes 1979).

Berkenkotter (1981) claims that skilled writers automatically internalize their audiences as they write. This imagined audience becomes the basis upon which the writer tests different rhetorical, organizational, and stylistic decisions. Rubin and Piche (1979) found that the syntactic complexity and the strategy used in writing differed significantly with the intimacy of the audience addressed.

Researchers in the "audience analysis" tradition have been debating the issue of whether skilled writers address a real (Mitchell and Taylor 1979) or fictional (Ong 1975; Long 1980) audience. Pfister and Petrik (1980) argue that while writers may have to fictionalize their audience to some extent, the fiction needs to be based solidly in reality. While the debate on the best way to help students learn to conceptualize their audience continues (Ede & Lunsford 1984), there is sufficient evidence to indicate that audience analysis plays a critical role in the process of writing by skilled writers. These studies confirm for the idea that writing is, by its very nature, a communicative act.

The Novice Writer and the Context of Writing

Now we turn to the constraints on the task of writing that result from the lack of skill of the novice writer. A certain amount of social

knowledge is necessary for one to be able to direct writing to a specific audience. How and when audience analysis develops in novice writers has been a major question of much of the research on children's writing.

The ability to take the perspective of others underlies the ability to conceptualize an audience in writing (Kroll 1978). Shatz and Gelman (1973) demonstrated that children as young as four years of age altered their speech when addressing different audiences. This indicates that young children are able to analyze the needs of their audience and use this knowledge appropriately.

In contrast to this finding about children's speech, most cross-grade studies of children's writing report no significant shifts in audience until students are in the 8th or 10th grade. Smith and Swan (1977) compared 6th graders with college students and found that only the college students showed a significant audience adaptation effect when rewriting a passage for audiences younger, older and at the same level. Bracewell, Scardamalia and Bereiter (1978) found that from a group of 4th, 8th, 12th and college age students, only the 12th graders and college students varied the number of context statements for different audiences. Crowhurst and Piche (1979) compared narrative, descriptive and persuasive essays of 6th and 10th graders addressed to two audiences-- the teacher and a good friend. They found significant audience effects at grade 10 but none at grade six.

Flower (1979) finds that elementary students pay almost no attention to audience in their writing and suggests a developmental account for this difference. She describes the writing of young children as a transformation of inner-speech to "writer-based prose" which slowly develops into "reader-

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based prose" as the students learns "to take the reader and his purpose in reading into account" when creating the text.

Quick (1983) argues that younger students can be just as aware of their audience as older students but their written work may not reflect this awareness. She examined the written work of 4th, 8th, 12th and college age students and interviewed the writers. In the interviews, all groups indicated an awareness of audience, but the nature of the awareness varied. The older students exhibited a more abstract audience awareness and they were much more likely to take the audience into account than were the younger students.

An interesting contrast to these studies comes from researchers who have compared children's spontaneous writing (self-sponsored) either in the home or school settings; they find that young children can and do write to different audiences (Florio and Clark 1982; Hudson 1985). Hudson finds that first- to fifth-graders showed more attention to audiences, writing purposes, and genres in their self-sponsored writing than in their classroom assigned writing. There was also a steady increase in the number of different categories in each of these areas for self-sponsored writing but almost no increase from first grade forward in the assigned writing.

Rubin (1984) reviews the inconsistencies in the studies of the development of social cognition to writing skills and suggests that much of the confusion comes from treating social cognition as a "monolithic, unitary construct." He proposes a multivariate developmental model to understand the complex relationship of social cognition and its relationship to

audience analysis in writing.

The Classroom Context of Writing

The way that writing is taught and practiced in classrooms provides students with almost no experience in writing to different audiences. Students are taught either directly or indirectly to channel their writing for teacher evaluation. In a large scale study of writing in secondary schools, Applebee (1981) found that there were relatively few instances of writing addressed to someone other than the teacher. Using the broadest definition of "wider audience" (including all writing from sophisticated essays to informal notes and letters addressed to anyone other than the teacher), he found that less than 12% of all school writing was for communicative purposes.

Applebee noted that although writing addressed to wider audiences was relatively rare in the sample, it was evidently valued by the teachers. Writing which was addressed to a wider audience was significantly overrepresented in the highest scored papers and underrepresented in the lowest scored papers.

Writing to a specified audience other than the teacher is not only uncommon in elementary and secondary schools but also in college composition (Ede 1979). Britton (1975) claims that a highly developed sense of audience in writing is the mark of a competent, mature writer. While the importance of learning to direct one's writing to specific audience is frequently cited, educators often find it difficult to develop audience awareness in the confines of the classroom. The classroom context is blamed for the lack

of "real world writing situations:"

> Unlike real world writing situations, which confront the writer with a variety of rhetorical situations and audiences with differing needs, school writing demands that the student write for a single authority, the teacher. To this authority, the student must demonstrate her authority on a given subject. Small wonder that researcher have found students to be topic bound. School writing stifles the development of audience representation because it precludes its necessity (Berkenkotter 1981:366).

Computer Networks as a way to create audiences

The increased cognitive demands of writing are cited as an explanation for the disparity between the age at which students can adapt their speech and their writing to different audiences (Kroll, 1978; Daiute, 1985). Writing to real audiences in not a common activity for younger students. In many of the experiments cited the students were told to imagine that they were writing to a particular audience. It is possible that students responded to the assignment without paying much attention to the imaginary audience. The lack of audience effects found in classroom writing may be an artifact of the way that children are taught to write and not a lack of developmental readiness to adapt their writing to specified audiences.

Computer networks provide the opportunity to create real audiences for students' writing within the classroom (Vivion, 1986; Rubin, Bruce and the Quill Project, 1984; Sayers 1986, Daiute, 1985a) and for classrooms in distant locations (Levin, Riel, Rowe and Boruta, 1984; Riel 1985; Cohen, Levin and Riel, 1985). Written work that is shared through computer networks is received in a form that can be easily read, revised and reprinted (Daiute, 1985a). This makes it possible, for example, for students in

different locations to serve as national or international reporters for school newspapers. There are a number of ways in which connecting students from distant locations by computer networks leads to an ideal situation for them to learn how to address different audiences: (1) Since face to face interaction is not possible, writing becomes the primary channel of communication (Cohen and Miyake 1986, Barnhardt 1985); (2) Information about students' lifestyle, often taken for granted, becomes a topic for writing (Cohen, Levin & Riel 1986). (3) Students can enrich their own observations in science projects through cooperative work with students in other locations (Levin & Cohen 1986). This sharing of information and the cooperative work provide the rhetorical purpose in writing and has lead to improvements in students writing (Mehan, Moll and Riel, 1985).

In this study we compare the quality of students' essays written in two different conditions: essays written to communicate with a real audience (students' peers in different countries) and essays written for teacher evaluation for a semester grade. The questions we ask are:

(1) Does the quality of writing improve when a real audience is addressed?

(2) Are 7th graders able to adapt their writing to different audiences?

METHOD

The subjects in this study were 7th grade students from two classrooms with 22 students in each class. The students composed two essays in Hebrew. One of these essays was required by the students' teacher as a regular midterm examination; the other essay was written to peers in other countries

after students learned of their participation on the "InterCultural Learning Network" (Cohen, Levin & Riel 1985; Cohen and Miyake 1986). One of the projects on this computer network is an international newswire service. Newspaper articles for the News network are written on microcomputers and sent "over the wire" using modems and telephone lines to an "electronic mailbox" in a network of computers located in Virginia, USA. Students and teachers from other locations contact this electronic mailbox and retrieve the articles again through computer modems and telephone lines. Articles are selected, revised and edited to be included in each sites' local version of the Computer Chronicles newspaper.

This study was explicitly designed to test the effect of a target audience on students' writing before they learned to use the computer for writing. The students wrote their essays with pencil and paper in Hebrew. The essays for the network were then translated by the bilingual students into Spanish or English and typed on the computer to be sent to their computer linked audience.

The two compositions were written a week apart from each other. One of the classes was given the essay examination first. One week later, they were informed of their participation on the computer network and asked to write essays on the same topics, but directed to their peers in other countries. The other class was first told about the network and asked to write a descriptive story to their international peers. One week later they were asked to write an essay on the same topic for their midterm exam. The essays were each written during a single class session.

The writing assignment included a list of possible topics for the students to select. The topics provided were those usually used by the teachers such as: review a recent sports game, describe the recent major power failure, explain what happens when your father goes to military reserve duty, etc.

All the essays were evaluated by their teacher who graded the papers on a 0-100 scale and gave written comments on the papers. Each pair of essays was also compared by two judges using an analytic evaluation profile based on the Composition Profile Method (Jacobs, Zinkgraf, Wormuth, Hartfiel and Hughey, 1981). The profile deals with 5 aspects of the composition: Content, Organization, Vocabulary, Language Use and Mechanics.

RESULTS

The teachers did not believe that writing for a real peer audience would result in better quality papers. The teachers assumed that the essays written by the students for their semester grade would be better than those written to their peers because they would take more care in both the content and the form of their writing when grading was involved. After the papers were scored the teachers were surprised to learn that they had scored the essays written to peers on the computer network higher than those written for a midterm exam. This was true regardless of the order in which they were written (Table 1).

	Classroom 1		Classroom 2	
	Written for network (first)	Written for midterm exam (later)	Written for network (later)	Written for midterm exam (first)
mean	72.86	66.90	77.50	72.50
sd	(8.0)	(7.3)	(7.2)	(6.1)
n	22	22	22	22
t-test	t = 5.56		t = 6.80	
	p < .001		p < .001	

Table 1: Evaluation of students essays written in the two conditions by classroom teachers.

Teachers judged the essays written to their peers on the network for communicative purposes higher by more than half a standard deviation than those written for the teacher to determine their midterm grade.

Table 2 presents the average score in each of the five composition criteria, as well as a total score and the number of words, for each set of papers when they were scored by independent judges. Scores are on a 1 (low) to 4 (high) scale.

	Writing for network X (sd)	Writing for teacher X (sd)	Diff.	T-test	p
Content	2.65 (.92)	2.14 (.64)	.51	4.37	.001
Organization	2.74 (.93)	2.09 (.75)	.65	4.91	.001
Vocabulary	2.26 (.82)	2.14 (.77)	.12	2.35	.05
Language use	2.35 (.90)	1.93 (.70)	.42	4.14	.001
Mechanics	2.44 (.77)	2.30 (.74)	.14	2.22	.05
Total score	12.44 (3.89)	10.60 (3.09)	1.84	5.04	.001
N of words	149.50 (41.09)	147.51 (52.64)	2.01	.63	ns

Table 2: Evaluation of students essays written in the two conditions by independent judges.

The analytic scores show the same effect found in teachers' holistic scoring. Students' writing is better when they are writing for a real audience, than when they are writing for a semester term grade. The stronger effects are in the organization, content and language use of the essays, where the average difference between the essays amounts to more than half standard deviation. The students' essays written for an audience were more fluent, better organized, and their ideas were more clearly stated and supported than in those written for a grade. Their content was more substantive and the thesis was better developed. The use of language was more effective, incorporating more complex constructions and having less errors of agreement.

Milder, but significant, effects were found in the Vocabulary and Mechanics aspects of the Composition Profile. The size of the difference between the writings amounts to less than one fifth of the standard deviation. The total score shows a strong effect due to the addition of the effects found in all the scales.

There is no significant difference in the number of words when writing for the teacher or for the network. An examination of the essays indicated that in most cases the more substantive and elaborated sentences written for the network did require more words. However, this increase in length was offset by the absence of irrelevant descriptions of unconnected events and unnecessary long introductory or closing comments that often characterized the essays written for the midterm grade.

The correlation between the teachers' grades and the analytic scores

were fairly even ranging between .47 to .65. The highest correlations are between teachers grades and the analytic scores on content and organization. However based on the written feedback that the students received from their teachers, the students may not be completely aware of the importance teachers ascribe to the content and organization of the paper. Teachers comments on the papers were categorized into one of the analytic categories. The overwhelming majority of the teachers comments to the students concerned punctuation and spelling (93.1%) with only a few comments on the language use (2.6%), content (2.6%) or organization (1.7%) of their writing. This finding parallels the past research which finds that teachers comments on vocabulary, organization and content are uncommon in their feedback with majority comments on mechanics and grammar (Cohen, 1985).

The answer to the second question - Are students able to adapt their writing to different audiences? - was also positive. Content analysis of the differences between the pairs of articles indicates that students were analyzing their audiences. In a pair of excerpts from an essay which describe a family watching a a basketball game, for example, we see clear differences:

> (for the teacher) It was Thursday, all the family was in the living room there was a game of Maccabi against CSKA, tension filled (verb error in hebrew) the house - Maccabi 90 CSKA 102, two more minutes to the end of the game...
>
> (for the network) It was Thursday evening, my family was in the living room in front of the TV there was a Basketball game between Maccabi Tel-Aviv the Israeli Champions and CSKA. There were two minutes left to the end of the game CSKA was leading Maccabi Tel-Aviv by 12 points. There was much tension in the house...

The abbreviated account written by the students to the teacher seems to

assume that they share sufficient background knowledge of the specified game and the crossnational rivalry to understand the description without difficulty. When writing to communicate with peers in other countries, the students seem to realize their audience do not share their background knowledge; therefore they were far more explicit. The type of game is indicated and the time and place is specified--it took place in the evening on a television set rather than the less explicit "in the living room." Maccabi Tel Aviv is identified as the national champions in Israel; the identity of the Russian team is assumed to be common knowledge. The score is described in words instead of the abreviated form written for the teacher. The inclusion of details like these contributed to the teachers' higher assessment of the essays written for the network.

In the essays describing fathers being called for reserve duty written for the network, there were often descriptions of the forms of reserve duty or explanations of the various danger zones in Israel. This type of information did not appear in the essays written for the teacher. The students seemed to assume that explicitness and further elaboration was redundant when writing for the teacher. Their assumption of a shared background of experiences between themselves and their teacher resulted in more abbreviated essays. These in turn received lower assessments by the teachers.

Audience awareness also led to a change in the use of colloquial expressions. When writing for their peers in other countries, the students were less likely to use slang or personal expressions. In an essay written to the teacher, for example, a student wrote: "mother was sitting 'stam', while my 'katanchik' brother was bored." By placing the words in quotes the

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student signals that these words have a special meaning which the teacher will understand. (In Hebrew stam means undefined and is used to mean doing nothing and katanchik is an affectionate way of saying small and cute.) When writing for the network expressions like this were not used. The decrease in colloquial expressions indicated that the students were analyzing the needs of their audience as they composed their essays.

Students' writing for the teacher was often similar to a verbal account of the events, forming a serial string of sentences, each providing some new information but without really "building" a main idea to be conveyed. Teachers' remarks appended to these compositions focused on the lack of consistency, logical sequencing and development of topic: "irrelevant introduction", "there is no relation among the events described", "lacks continuity and organization", "the title does not fit the content of the story", "Should not change the point of view, the time and the person in the middle of your composition". However the compositions written by the same students for the network usually showed clear chaining of sentences toward the expression of a main idea.

Though we lack the process information about the students' writing which is necessary to substantiate our claim, we have the impression that the students devoted more thought to the content and the organization of their essays when writing for the network than when writing for the teacher. The following example shows large differences in writing ability even though they were written by the same student, one week apart from each other:

> (For the teacher) Wednesday night there was a movie. It was a movie it was a movie of murder and kidnapping. After 3/4 of an hour

> exactly when the kidnapping and the shooting started, then a weird noise started on the television in the beginning only the voice stopped and a sssssss.... was heard and the picture could be seen. after that also the picture was like snow white white balls. Suddenly a pak pak was heard and the television turned off and from behind appeared stinky smoke. In the beginning we thought it would explode so we disconnected it from the outlet after that my father.....
>
> (for the network) On Monday 20 January we heard in the radio a recruitment call to reserve duty for soldiers. In Israel we have several methods to call soldiers to their stations some receive a call order in a letter and some through the radio or the TV. special names are called like shoe, ball, eraser. They are secret names for each unit. And every soldier that hears his password enlists himself in his battalion. As soon as possible. After each call the password is replaced so others will not know this is a secret password. My father was sitting in the living room in the evening when he heard the announcement on the TV. The announcer said .....

The first paragraph written to the teacher is very similar to a verbal account of events, as the student would relate it to any listener. The sentences are reasonable Hebrew utterances when spoken face to face to another person. The second paragraph, written for the network, is more clearly a written account of events. It has a textual, not a discourse structure: the story opens with a sentence describing the triggering event of the story and then goes for a relatively long detour to describe to the audience some background information before resuming the story. This organization obviously requires some preplanning and a clear awareness of the audience to whom the essay is directed. The fact that teachers' grading was higher for the more "audience-aware" compositions points to the importance they ascribe to this factor.

Finally, there was also a difference in the aesthetic presentation of the essays written for the network. These essays were on the average tidier, better distributed in the page, dated, signed and sometimes also decorated with colored titles and underlining. This attention to presentation may

result from the students' awareness that their work will be seen by their peers translating their messages and will reflect on themselves.

DISCUSSION

The teachers' assumption that writing for a grade would result in better essays was not supported. In this experiment students wrote better essays when they were trying to communicate information and ideas with their distant peers than when they were self-consciously trying to write their best for an examination. The essays written to a real audience were better organized and dealt with the content in a more informative and elaborate fashion.

Why were there differences in elaboration under the two experimental conditions? The answer seems to do with the students' perception of audience in functional writing environments. Seventh-grade students had no difficulty adapting their writing to two different audiences, their peers and the teachers. Unlike studies that find a lack of effect for audience at this grade (Bracewell, Scardamalia & Bereiter 1978; Crowhurst & Piche 1979; Flower 1979), the students "tailored" the contents and the form of their essays to the perceived audience. When they write for their teachers, students assume they share large amounts of background information. Therefore this information is considered unnecessary and not included. They also perceive the teacher as close to them so they use slang expressions and write colloquially. When writing for peers in other countries, the background information is not shared and therefore must be included. Slang expressions are replaced for ordinary prose and the writing is more organized and less colloquial.

The difference in the essays written for the network and for their term grade indicated that students did use information about their intended audience to shape their writing, but that this process led to lower teacher evaluation of their writing skill. The students' perceived-audience when writing for a grade, was their specific teacher, yet teachers judged the essays as if they were directed or addressed to a general audience. Thus the students were caught in a "trap" because of an implicit expectation that when writing for the teacher they would not write to the specific teacher but instead direct their writing to a general unspecified audience.

In effect there is often an unspoken rule operating in the classroom that directs students to "write as if" they were writing to an audience that the teacher has in mind. Students are also asked to "write as if" they have something to say on a topic that is often selected by the teacher. Even though the general topics in this experiment were given to the students, they were able to select something that they wanted to share with students in other countries. As students continued their interaction on the InterCultural Learning Network, they were able to select topics for writing that were of particular interest to themselves or that had been requested by their peers in other countries. In this way, the students have the opportunity to explore topics in which they have information that they want to share with interested readers. When students describe their social grouping and friendship patterns or their reactions to the threat of war, it is to help others understand how they are similar or different from students in other countries. The network activities provide a communicative goal in writing which is often absent in classroom writing.

CONCLUSION

Our results show a clear improvement in writing when students' wrote to communicate with a specified audience as compared to when they wrote to demonstrate their skill for teacher's evaluation. A crucial element of writing is the goal of the writer to express facts or ideas across time or place. Adults write primarily when they have the need or desire to convey information to a potential audience (oneself included) through time and space. Whether the information to be conveyed is well defined before writing or whether it is consolidated in the process of writing, the intention to transmit that information is central. When students are required to "write as if" they have information to convey, and to "write as if" they are addressing some unspecified audience, the task of writing often becomes an artificial and meaningless one.

"Write as if" situations are often encountered in classrooms from first grade to college. They are the outcome of an unfortunate separation of school from society. The efforts to create meaningful learning environments for writing are a way to counter this trend of decontextualized learning. Some teachers of writing try to attenuate "write as if" situation by making the audience and the goal explicit for the student in a role playing exercise (Ede 1979). The assignment becomes "Pretend you are X writing to Y for Z purpose." The exercise remains hypothetical, however, because the text is never read by anyone except the teacher and the students know it.

Learning does not have to be totally separated from the contexts in which it is applied. Writing is much more effectively learned when students

are writing to audiences for purposes rather then practicing writing in "write as if" settings, even when the imaginary audience and purpose is made explicit. By contextualizing the skill in real activities, students are more likely to utilize skills learned in classrooms outside of school. Thus, if we design an environment in which students write for specified audiences, on topics about which they want to convey information, we will be developing the skill in a similar situation as will exist when they write outside of the classroom in the society at large.

One of the reasons that students spend so much of their time in "write as if" practice settings is that their writing has always been done by hand. Reading another person's handwriting is a difficult task and especially difficult if the person's fine motor control is still developing. Teachers spend a great deal of time trying to decipher what is written and very few other people of any age are willing to do this. However, computer printouts of students' writing can be easily read. Word processing on a computer equipped with a printer makes it possible for students to spend more of their time in classrooms writing to real audiences with meaningful goals. Computer networks make it possible for students to send their messages to groups of other people that are likely to be interested in what they want to write about, providing a possible first step for the reintegration of students into the larger society.

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